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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/736,163	12/15/2000	Koichi Yoshimi	1614.1103	8082

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EXAMINER

LI, AIMEE J

ART UNIT	PAPER NUMBER
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2183

DATE MAILED: 06/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/736,163

Applicant(s)

YOSHIMI, KOICHI

Examiner

Aimee J. Li

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 March 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11, 12, 14, 15 and 17-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11, 12, 14, 15 and 17-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 11-12, 14-15, 17-19, and new claims 20-23 have been considered. Claims 12, 15, and 18-19 have been amended as per Applicant's request. New claims 20-23 have been added as per Applicant's request.

Papers Submitted

2. It is hereby acknowledged that the following papers have been received and placed of record in the file: Amendment as received on 21 March 2005

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 11-12, 14-15, and 17-23 are rejected under 35 U.S.C. 102(b) as being taught by Ueda et al., U.S. Patent Number 5,228,131 (herein referred to as Ueda).

5. Referring to claims 11 and 17, Ueda has taught wherein the fourth part performs initialization based on prediction information given to the branch instruction (Ueda Abstract; column 3, lines 18-41; column 15, lines 25-54; column 16, lines 36-64; column 21, lines 42-62; Figure 5; and Figure 6).

6. Referring to claims 12 and 18, Ueda has taught an arithmetic and logic unit or an information processing apparatus, comprising:

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- a. A first part performing a branch prediction in response to a branch instruction (Ueda Abstract; column 3, lines 18-41; column 15, lines 25-54; column 16, lines 36-64; column 21, lines 42-62; Figure 5; and Figure 6);
 - b. A second part updating a transition probability of the branch prediction according to whether a branch is actually made (Ueda Abstract; column 3, lines 18-41; column 15, lines 25-54; column 16, lines 36-64; column 21, lines 42-62; Figure 5; and Figure 6);
 - c. A third part detecting that a process is switched (Ueda Abstract; column 3, lines 18-41; column 15, lines 25-54; column 16, lines 36-64; column 21, lines 42-62; Figure 5; and Figure 6); and
 - d. A fourth part initializing branch prediction information when the third part detects that the process is switched (Ueda Abstract; column 3, lines 18-41; column 15, lines 25-54; column 16, lines 36-64; column 21, lines 42-62; Figure 5; and Figure 6), and
 - e. Wherein the fourth part fixedly performs initialization of the branch prediction information according to a branch destination of the branch instruction to set the branch prediction information to predetermined branch prediction information regardless of past branch prediction results, without depending on a particular process (Ueda Abstract; column 3, lines 18-41; column 15, lines 25-54; column 16, lines 36-64; column 21, lines 42-62; Figure 5; and Figure 6).
7. Referring to claim 14, Ueda has taught wherein said initializing comprises performing initialization based on prediction information given to the branch instruction (Ueda Abstract;

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column 3, lines 18-41; column 15, lines 25-54; column 16, lines 36-64; column 21, lines 42-62; Figure 5; and Figure 6).

8. Referring to claim 15, Ueda has taught a branch prediction method, comprising:
 - a. Performing a branch prediction in response to a branch instruction (Ueda Abstract; column 3, lines 18-41; column 15, lines 25-54; column 16, lines 36-64; column 21, lines 42-62; Figure 5; and Figure 6);
 - b. Updating a transition probability of the branch prediction according to whether a branch is actually made (Ueda Abstract; column 3, lines 18-41; column 15, lines 25-54; column 16, lines 36-64; column 21, lines 42-62; Figure 5; and Figure 6);
 - c. Detecting that a process is switched (Ueda Abstract; column 3, lines 18-41; column 15, lines 25-54; column 16, lines 36-64; column 21, lines 42-62; Figure 5; and Figure 6); and
 - d. Initializing branch prediction information when said detecting detects that the process is switched (Ueda Abstract; column 3, lines 18-41; column 15, lines 25-54; column 16, lines 36-64; column 21, lines 42-62; Figure 5; and Figure 6), and
 - e. Wherein said initializing includes fixedly performing initialization of the branch prediction information according to a branch destination of the branch instruction to set the branch prediction information to predetermined branch prediction information regardless of past branch prediction results, without depending on a particular process (Ueda Abstract; column 3, lines 18-41; column 15, lines 25-54; column 16, lines 36-64; column 21, lines 42-62; Figure 5; and Figure 6).

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9. Referring to claim 19, Ueda has taught a method of performing a branch prediction in response to a branch instruction, comprising:

- a. Detecting whether a process is switched (Ueda Abstract; column 3, lines 18-41; column 15, lines 25-54; column 16, lines 36-64; column 21, lines 42-62; Figure 5; and Figure 6); and
- b. Setting the branch prediction to predetermined branch prediction information regardless of past branch prediction results upon detecting that the process is switched, where the initializing branch prediction information is initialized according to a branch destination of the branch instruction without depending on a particular process (Ueda Abstract; column 3, lines 18-41; column 15, lines 25-54; column 16, lines 36-64; column 21, lines 42-62; Figure 5; and Figure 6).

10. Referring to claim 20, Ueda has taught a method of performing a branch prediction in response to branch instructions, comprising:

- a. Storing branch prediction information based on past branch results in relation to the branch instructions (Ueda Abstract; column 3, lines 18-41; column 15, lines 25-54; column 16, lines 36-64; column 21, lines 42-62; Figure 5; and Figure 6);
- b. Detecting whether a process switch has occurred based on a program count address (Ueda Abstract; column 3, lines 18-41; column 15, lines 25-54; column 16, lines 36-64; column 21, lines 42-62; Figure 5; and Figure 6). In regards to Ueda, to clear the branch prediction information on a context switch, it must be detected based on the program count address.

- c. Setting a branch prediction in relation to one of the branch instructions to a predetermined branch regardless of the stored branch prediction information upon detecting that the process has switched (Ueda Abstract; column 3, lines 18-41; column 15, lines 25-54; column 16, lines 36-64; column 21, lines 42-62; Figure 5; and Figure 6).
11. Referring to claims 21 and 23, Ueda has taught an arithmetic and logic unit or An information processing apparatus, comprising:
- a. A first part performing a branch prediction in response to a branch instruction (Ueda Abstract; column 3, lines 18-41; column 15, lines 25-54; column 16, lines 36-64; column 21, lines 42-62; Figure 5; and Figure 6);
 - b. A second part updating a transition probability of the branch prediction according to whether a branch is actually made (Ueda Abstract; column 3, lines 18-41; column 15, lines 25-54; column 16, lines 36-64; column 21, lines 42-62; Figure 5; and Figure 6);
 - c. A third part detecting that a process is switched (Ueda Abstract; column 3, lines 18-41; column 15, lines 25-54; column 16, lines 36-64; column 21, lines 42-62; Figure 5; and Figure 6); and
 - d. A fourth part initializing branch prediction information when the third part detects that the process is switched (Ueda Abstract; column 3, lines 18-41; column 15, lines 25-54; column 16, lines 36-64; column 21, lines 42-62; Figure 5; and Figure 6), and

- e. Wherein the fourth part performs initialization according to a branch destination of the branch instruction by determining an initialization value according to a comparison of a program counter value with a branch destination address (Ueda Abstract; column 3, lines 18-41; column 15, lines 25-54; column 16, lines 36-64; column 21, lines 42-62; Figure 5; and Figure 6) and a determination of whether a branch prediction direction is backward taken (BT) or forward not taken (FN) (Ueda column 15, lines 25-54; column 16, lines 36-64; column 21, lines 42-62; Figure 5; and Figure 6). In regards to Ueda, the loop branches described in column 15, lines 25-54 is a backward branch and determining whether a branch is taken or not for both forward and backward branches.
12. Referring to claim 22, Ueda has taught a branch prediction method, comprising:
- a. Performing a branch prediction in response to a branch instruction (Ueda Abstract; column 3, lines 18-41; column 15, lines 25-54; column 16, lines 36-64; column 21, lines 42-62; Figure 5; and Figure 6);
 - b. Updating a transition probability of the branch prediction according to whether a branch is actually made (Ueda Abstract; column 3, lines 18-41; column 15, lines 25-54; column 16, lines 36-64; column 21, lines 42-62; Figure 5; and Figure 6);
 - c. Detecting that a process is switched (Ueda Abstract; column 3, lines 18-41; column 15, lines 25-54; column 16, lines 36-64; column 21, lines 42-62; Figure 5; and Figure 6); and

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- d. Initializing branch prediction information when said detecting detects that the process is switched (Ueda Abstract; column 3, lines 18-41; column 15, lines 25-54; column 16, lines 36-64; column 21, lines 42-62; Figure 5; and Figure 6), and
- e. Wherein said initializing comprises performing initialization according to a branch destination of the branch instruction by determining an initialization value according to a comparison of a program counter value with a branch destination address (Ueda Abstract; column 3, lines 18-41; column 15, lines 25-54; column 16, lines 36-64; column 21, lines 42-62; Figure 5; and Figure 6) and a determination of whether a branch prediction direction is backward taken (BT) or forward not taken (FN) (Ueda column 15, lines 25-54; column 16, lines 36-64; column 21, lines 42-62; Figure 5; and Figure 6). In regards to Ueda, the loop branches described in column 15, lines 25-54 is a backward branch and determining whether a branch is taken or not for both forward and backward branches.

Response to Arguments

13. Applicant's arguments with respect to the claims above have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure as follows: Applicant is reminded that in amending in response to a rejection of claims, the patentable novelty must be clearly shown in view of the state of the art disclosed by

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the references cited and the objections made. Applicant must also show how the amendments avoid such references and objections. See 37 CFR § 1.111(c).

- a. Brown, III et al., U.S. Patent Number 5,394,529, has taught branch prediction during context switches.
- b. Bala, U.S. Patent Number 6,233,678, has taught branch prediction handling during context switches.
- c. Ries et al., U.S. Patent Number 6,701,426, has taught handling branch prediction in a multiple instruction set processor with context switches.

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

16. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

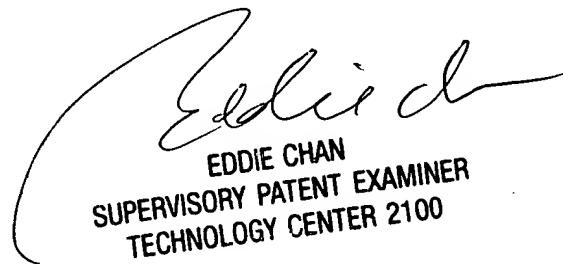
17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aimee J. Li whose telephone number is (571) 272-4169. The examiner can normally be reached on M-T 7:30am-5:00pm.

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18. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Chan can be reached on (571) 272-4162. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

19. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AJL
Aimee J. Li
10 June 2005



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